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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,326

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Naoki Nishiura

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EXAMINER

FANG, SHANE

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/591,326	<b>Applicant(s)</b> NISHIURA ET AL.	
	<b>Examiner</b> SHANE FANG	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 17-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/31/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

None of the X references listed on ISP is anticipatory, because they fail to disclose using more than one tetracarboxylic acid derivatives.

### ***Election/Restrictions***

The applicant selected Group II (claims 7-16) without traverse. This restriction is made FINAL.

### ***Claim Rejections - Double Patenting***

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 7 and 12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 5 of copending Application No. 12/441980. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 7 and 12 are anticipated by claim 1 and 5 of 12/441980, because they disclose a composition of polyamic acid and carbon black, wherein the polyamic acid obtained by reacting asymmetric and other dianhydride reacts with diamines at substantially equimolar amount. The said polyamic acid can be 6000 g/mol ([0052] in 12/441980) as oligomer.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 7-8, 10, 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Paul et al. (US 5138038).

As to claim 7, Paul et al. discloses a composition comprising oligomeric polyamic acid (2:39-41) reacted by mixture of dianhydrides (7:40-41) with diamine at stoichiometric equivalent ratio (9:4-6) in polar organic solvent such as NMP (9:54). Carbon black or graphite as additional fillers can also be included (12:1, 11:63-65). The reference is silent on “semi-conductive”. However, In view of the substantially identical composition, it appears that the adduct would have inherently possessed the claimed properties. See MPEP § 2112. In this particular case, the disclosed composition meets all chemical and process (condensation) requirement as claimed invention. Consequently, the disclosed composition would inherently be “semi-conductive”.

As to claim 8, Paul et al. discloses the polyamic acid is obtained by condensation at 10-60 °C in NMP (9:52-64).

As to claim 10, Paul et al. discloses the polyamic acid is obtained by condensation of mixtures of diesters of tetracarboxylic acid (7: 40-41) but is silent on the reaction temperature. However, claim 9 is a product-by-process claim that are limited by and defined by the product. Determination of patentability is based on the product itself, not on its method of production. See MPEP § 2113. In this particular case, the instant specification ([0176]) discloses to obtain desired molecular weight (oligomer) by condensation via diester of tetracarboxylic acid and diamine at 90-120 °C. The resultant oligomeric polyamic acid shows no chemical and molecular weight difference.

As to claim 12, Paul et al. discloses the oligomeric polyimide and its corresponding polyamic acid would have a molecular weight of 5530, when  $n=20$ ,  $r=1$ , dianhydrides are 3,4,3'4'-biphenyltetracarboxylic dianhydride and 2,2,3'4'-biphenyltetracarboxylic dianhydride (7:7-10), diamine is oxydianiline (4:4) on formula 1 (3:5).

As to claim 16, Paul et al. discloses a process of incorporating carbon black (inherently conductive) or graphite to the polyamic acid obtained by reacting multiple dianhydride with diamine to form an inherently "semi-conductive" composition (11: 62-68, 12:1-12).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul et al. (US 5138038) in view of Hasegawa et al. (Macromolecules 1999, 387-396) as listed on IDS and evidenced by Wilson et al. (Polyimide, Blackie & Son Ltd, 1990, Pg. 1-2, scheme 1.2).

Disclosure of Paul et al. is adequately set forth in paragraph 6 and is incorporated herein by reference.

Paul is silent on using a combination of asymmetric dianhydride (15-55 mol%) and symmetric dianhydride (45-85%) or equivalent diesters with the same ratio range as recited in claims 9 and 11.

Hasegawa et al. discloses a polyimide prepared by blend of a first polyamic acid (symmetric dianhydride (s-BPDA) with diamine) (80%) and a second polyamic acid (asymmetric dianhydride (a-BPDA) with diamine) (20%) to improve the thermal processability of polyimide based on BPDA/diamine without decreasing the  $T_g$  (Abs.). Hasegawa et al. discloses the polyimide can be used in films and composite (¶1, P.387). Hasegawa et al. discloses the blend is carried out by blending S-BPDA based polyamic acid with a-BPDA based polyamic acid (¶1, P.388). As evidenced by Wilson et al., the blending would results in a polyamic acid composition having same structure

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and reaction sequence as recited in claims 9 and 11. Wilson shows the synthetic routes of the application and reference are both 2-step method, where in polyamic acid is prepared first and cured to polyimide. Note the reaction of forming polyamic acid is a reversible process. This implies that said blending would result in reaction of a-BPDA and s-BPDA with diamine with molecular rearrangement on the backbone, and the resultant polyamic acid equal to S-BPDA(80%)/a-BPDA(20%)/PPD-diamine.

Therefore, as to claims 9 and 11, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the composition disclosed by Paul et al. and use the asymmetric/symmetric dianhydride ratio in light of Hasegawa et al, because the resultant composite film would have improved the thermal processability and retained  $T_g$ .

7. Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paul et al. (US 5138038) in view of Kanetake et al. (US 6303054).

Disclosure of Paul et al. is adequately set forth in paragraph 6 and is incorporated herein by reference. Paul et al. further teaches the disclosed polyimide and corresponding polyamic acid can be used as molding compounds with fillers like graphite (13:9-13) or carbon black (12:1, 11:63-65).

Paul et al. is silent on the loading of carbon black.

Kanetake et al. a polyamic acid composition of molded product comprising a preferable 7-8% parts by weight per 100 parts of polyamic acid (4:45) to obtain

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semiconductivity (electrical resistivity  $10\text{-}10^{14} \Omega\text{cm}$ ) in polyamic acid composition (3:54-58) and high stability of resistivity (5:49-52)

Therefore, as to claim 13, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the composition disclosed by Paul et al. and use carbon black loading as taught by Kanetake et al, because the resultant polyamic acid composition would have stable semiconductivity.

8. Claims 7 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanetake et al. (US 6303054) in view of Paul et al. (US 5138038).

As to claims 14-16, Kanetake et al. discloses a process of produce semiconductive seamless tubular polyimide films for intermediate belt member for transfer in a copy machine by rotational molding polyamic acid composition followed by heating (5:54-68, 6:1-35), wherein the polyamic acid composition contains carbon black uniformly dispersed in polyamic acid (4:55) and equivalent amount of diamine and dianhydride is reacted (Ex.1).

Kanetake et al. is silent on polyamid acid being oligomeric and prepared from multiple dianhydrides as recited in claim 14-16, and 7.

Paul et al. discloses a composition comprising oligomeric polyamic acid (2:39-41) reacted by mixture of dianhydrides (7:40-41) with diamine at stoichiometric equivalent ratio (9:4-6) in polar organic solvent such as NMP (9:54). Carbon black or graphite as additional fillers can also be included (12:1, 11:63-65). Paul et al. teaches the disclosed polyimide and corresponding polyamic acid can be used as molding compounds with



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fillers like graphite (13:9-13). Paul et al. further teaches the disclosed polyamic acid and the corresponding polyimide have high fusion temperature for use in composite and molding compounds (1:10-15) and would minimize the problem with viscosity in the process (1:28-52).

Therefore, as to claims 7 and 14-16, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process disclosed by Kanetake et al. and use oligomeric polyamic acid and prepared from multiple dianhydrides as taught by Paul et al., because the resultant polyimide molded film would have higher fusion temperature and the process would be optimized due to the minimization of viscosity issue.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHANE FANG whose telephone number is (571)270-7378. The examiner can normally be reached on Mon.-Thurs. 8 a.m. to 6:30 p.m. EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sf

/Randy Gulakowski/  
Supervisory Patent Examiner, Art Unit 1796